COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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Commissioner

APPROVAL FOR REMEDIAL USE

Pursuant to Title 5, 310 CMR 15.000

Name and Address of Applicant:

Geoflow, Inc.
500 Tamal Plaza, Suite 506
Corte Madera, CA 94925

Trade name of technology and model**: Geoflow Subsurface Drip Wastewater Disposal System** (hereinafter called the "System"). A schematic drawing of a typical System and a technology checklist are attached and are a part of this Approval.

Transmittal Number: W 032585
Date of Issuance: September 26, 2003, Revised August 18, 2004

Authority for Issuance

Pursuant to Title 5 of the State Environmental Code, 310 CMR 15.000, the Department of Environmental, Protection hereby issues this Approval for Remedial Use to: Geoflow, Inc., 307 N-West Tremont Avenue, Charlotte, NC 28203 (hereinafter "the Company"), approving the System described herein for Remedial Use in the Commonwealth of Massachusetts. Sale and use of the System are conditioned on compliance by the Company and the System owner with the terms and conditions set forth below. Any noncompliance with the terms or conditions of this Approval constitutes a violation of 310 CMR 15.000.

SIGNED — August 18, 2004

Glenn Haas, Director — Date
Division of Watershed Management
Department of Environmental Protection

I. Purpose

1. The purpose of this approval is to allow Remedial Use of the System in Massachusetts with the necessary permits and approvals required by 310 CMR 15.000.

2. With the necessary permits and approvals required by 310 CMR 15.000, this Approval for Remedial Use authorizes the use and installation of the System in Massachusetts.

3. The System may only be installed where conditions meet the criteria of 310 CMR 15.284(2). The System is used to dispose of wastewater from an alternative system approved in accordance with 310 CMR 15.280 through 15.289 with effluent discharge concentrations that meet or exceed secondary treatment standards of 30 mg/L biochemical oxygen demand (BOD_5) and 30 mg/L total suspended solids (TSS

4. This Approval for Remedial Use allows the use of the System where the local approving authority finds that the System is for upgrade of a failed, failing or nonconforming system. The Title 5 design flow for the facility must be less than 2,000 gallons per day.

II. Design and Construction Standards

1. The System is a subsurface wastewater drip irrigation system that replaces a soil absorption system (SAS) designed in accordance with 310 CMR 15.000. The System consists of small diameter flexible polyethylene tubing, extruded with an inner lining of a biocide growth retardant compound to prevent slime buildup on the inner wall of the tubing. Pressure sensitive drip emitters spaced at regular intervals shall incorporate use of chemical root intrusion barrier to prevent root intrusion with a warranty period of no less than 10 years. The tubing is pressure dosed and the manifolds are sloped back to a pressure-dosing chamber (pump chamber). The System also consists of two manifolds or headers; one to feed and the other to flush the dispersal system, vents at the end of each header pipe, a field flush valve and a spin filter with stainless steel 100 micron/150 mesh screen. The System is designed to replace the SAS and to distribute effluent from a treatment system at a depth of 6 to 12 inches below the ground surface.

2. The System may be installed in the A, B or C soil horizon at a depth of 6 to 12 inches below the ground surface.

3. The System may be installed in soils with a percolation rate of up to 90 minutes per inch (MPI). The System shall not be installed in Class IV soils as defined in 310 CMR 15.242.

4. Effluent loading rates shall be as described in 310 CMR 15.242 except, however, for soils with percolation rates greater than 60 MPI, the effluent loading rate shall not exceed 0.1 gallons per day per square foot.

5. The System includes:

   A. A pump chamber and pump capable of delivering pressure of 10-45 psi at the SAS a minimum of 6 times per day. The field pressure shall be controlled using a pressure regulator or manual valves to achieve design pressure (10-45 psi).

   B. Time dosing for drip systems with a timer controller capable of operating the system during peak flow events without high-level alarms.

   C. A self-cleaning filter with a minimum 150-mesh size/100 micron screen installed prior to the discharge of effluent to the drip tubing. The filter shall be provided with a flush valve on the debris end; a ball with a constant bleed or a solenoid valve that can be activated by the timer.

   D. Air vacuum breakers at each high point of the drip header distribution system and on the drip line when the drip line is installed at a higher elevation than the headers.

   E. Wasteflow Classic or Wasteflow PC drip tubing lines are spaced 24 inches apart with drip tubing emitters spaced 24 inches on center. When smaller spacing is used the dispersal field shall still be sized based on the minimum 24-inch spacing. When tubing line spacing is greater than 24 inches by 24 inches, the size of the dispersal field shall be increased so that the number of emitters is equal to the number that would have been installed in the standard 24 inch by 24 inch scenario.

6. The effective effluent disposal area shall be calculated as the bottom area of the drip tubing system including a one-foot addition on each side or two square feet per foot of drip tube when tubing is spaced 2 feet apart. No sidewall credit shall be given for this System.

7. The drip tubing manifolds and supply lines and headers shall be sloped to allow effluent to drain back to the effluent pump chamber by gravity.

8. All valve boxes and air vacuum breaker boxes shall be insulated to prevent freezing.

9. The system designer shall complete and submit to the approving authority a System design worksheet included in the System Design Manual with the plans and specifications.

10. Drip tubing may be installed either with a vibrating plow in situ or by removing top soils and bedding the drip tubing in clean sand meeting the requirements for fill material in Title 5 at 310 CMR 15.255(3) with cover consisting of sand and topsoil

meeting the 6 to12 inch depth requirement. Vegetative cover must be replaced for installations where soils are removed and replaced.

11. Drip tubing shall not be installed when soils are frozen or saturated.

12. Prior to System start up, a clean water test of the System shall be performed in the presence of the approving authority to check for leaks and for the proper distribution of effluent.

III. **Allowable Subsurface Drip Soil Absorption Design**

1. Reduction of the Required Separation Distance to High Groundwater Elevation - An Applicant is eligible for a reduction in separation (four feet in soils with a recorded percolation rate of more than two minutes per inch or five feet in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of the SAS and the high groundwater elevation, where all of the following conditions are met. Accordingly, in approving design and installation of the System by a particular Applicant, the local approving authority may allow a reduction in the required separation (four feet in soils with a recorded percolation rate of more than two minutes per inch or five feet in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of SAS and the high groundwater elevation, provided that all of the following conditions are met:

A. A minimum two foot separation (in soils with a recorded percolation rate of more than two minutes per inch) or a minimum three foot separation (in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of the stone underlying the SAS and the high groundwater elevation is maintained.

B. No reduction in the required SAS size is allowed.

C. No reduction in the required four feet of naturally occurring pervious material is allowed unless the Applicant has demonstrated that the four foot requirement cannot be met anywhere on the site. Any such reduction must first be approved by the local approving authority and then approved by the Department pursuant to 310 CMR 15.284.

D. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, the local approving authority may allow a reduction under a local upgrade approval in accordance with 310 CMR 15.405 (1) (a), (b), (f), (g), and (h).

E. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, even taking into account provisions for local upgrade approval as described above, then pursuant to 310 CMR 15.410, the applicant first

must obtain variance(s) from the local approving authority and then approval of the Department.

2. Reduction of the Requirement for Four Feet of Naturally Occurring Pervious Material – An Applicant is eligible for a reduction in the required four feet of naturally occurring pervious material in an area of no less than two feet of naturally occurring pervious material, where all of the following conditions are met. Accordingly, in approving design and installation of the System by a particular Applicant, the local approving authority may allow a reduction in the required four feet of naturally occurring pervious material in an area with no less than two feet of naturally occurring pervious material, provided that all of the following conditions are met:

A. The Applicant has demonstrated that the four foot requirement cannot be met anywhere on the site. No reduction in the required SAS size is allowed.

B. No reduction in the required separation (four feet in soils with a recorded percolation rate of more than two minutes per inch or five feet in soils with a recorded percolation rate of two minutes or less per inch) between the bottom of SAS and the high groundwater elevation is allowed unless such a reduction is first approved by the local approving authority and then approved by the Department pursuant to 310 CMR 15.284.

C. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, the local approving authority may allow a reduction under a local upgrade approval in accordance with 310 CMR 15.405 (1) (a), (b), (f), (g), and (h).

D. Where full compliance with all of the minimum set back distances in 310 CMR 15.211 is not feasible, even taking into account provisions for local upgrade approval as described above, then pursuant to 310 CMR 15.410, the applicant first must obtain variance(s) from the local approving authority and then approval of the Department.

III. General Conditions

1. All provisions of 310 CMR 15.000 are applicable to the use of this System, the System owner and the Company, except those that are varied by the terms of this Approval.

2. All sample analysis must be conducted by an independent U.S. EPA or DEP approved testing laboratory, or a DEP approved independent university laboratory. It is a violation of this Approval to falsify any data collected, to omit any required data or to fail to submit any report required by such plan.

3. The facility served by the System and the System itself shall be open to inspection and sampling by the Department and the local approving authority at all reasonable times.

4. In accordance with applicable law, the Department and the local approving authority may require the owner of the System to cease operation of the system and/or to take any other action as it deems necessary to protect public health, safety, welfare and the environment.

5. The Department has not determined that the performance of the System will provide a level of protection to public health and safety and the environment that is at least equivalent to that of a sewer system. No System shall be installed, upgraded or expanded, if it is feasible to connect the facility to a sanitary sewer, unless as allowed by 310 CMR 15.004. When a sanitary sewer connection becomes feasible, the facility served by the System shall be connected to the sewer, within 60 days of such feasibility, and the System shall be abandoned in compliance with 310 CMR 15.354, unless a later time is allowed, in writing, by the approving authority.

6. Design, installation and operation shall be in strict conformance with the Company's DEP approved plans and specifications, 310 CMR 15.000 and this Approval.

IV. Conditions Applicable to the System Owner

1. The System is approved for the treatment and disposal of sanitary sewage only. Any wastes that are non-sanitary sewage generated or used at the facility served by the System shall not be introduced into the System and shall be lawfully disposed.

2. Effluent discharge concentrations from the treatment unit that discharges to the System shall meet or exceed secondary treatment standards of 30 mg/L BOD_5 and 30 mg/L TSS. The effluent pH shall not be less than 6.0 or more than 9.0 unless approved by the Department.

3. Operation and Maintenance Agreement:

   A. Throughout its life, the System owner shall operate and maintain the System in accordance with this Approval, the designer's operation and maintenance requirements, and the Company's approved procedures and sampling protocol. To ensure proper operation and maintenance (O&M), the System owner shall enter into an O&M agreement. No O&M agreement shall be for less than one year.

   B. No System shall be used until an O&M agreement is submitted to the approving authority which:

      i. Provides for the contracting of a person or firm competent in providing services, trained by the Company as provided in Section VI (7), to operate the

System consistent with the System's specifications and the operation and maintenance requirements specified by the designer and any specified by the Department;

ii. Contains procedures for notification to the Department and the local board of health within five days of a System failure or alarm event and for corrective measures to be taken immediately;

iii. Provides the name of an operator, which must be a Massachusetts certified operator if one is required by 257 CMR 2.00, that will operate and monitor the System. The operator must operate and visit the System at least every three months and anytime there is an alarm event.

iv. The System owner shall notify the Department and the local approving authority in writing within seven days of any cancellation, expiration or other change in the terms and/or conditions of their O&M agreement.

4. All samples shall be taken at a flowing discharge point, i.e. distribution box, pipe entering a pump chamber or other Department approved location from the treatment unit. Any required influent sample shall be taken at a point that will provide a representative sample of the influent. Influent sampling locations shall be determined by the system designer, subject to written approval by the Department.

5. Effluent from the treatment unit discharging to the System shall be monitored quarterly. At a minimum, the following parameters shall be monitored: pH, BOD_5, and TSS. The operator at each inspection/monitoring event shall visually inspect the disposal area where the System is installed for signs of breakout or dampness. After one year of monitoring and reporting and at the written request of the owner, the Department may reduce the monitoring and reporting requirements.

6. Prior to the issuance of a Certificate of Compliance for the System, the System owner shall record and/or register in the appropriate Registry of Deeds and/or Land Registration Office, a Notice disclosing both the existence of the alternative septic system subject to this Approval on the property and the Department's approval of the System. If the property subject to the Notice is unregistered land, the Notice shall be marginally referenced on the owner's deed to the property. Within 30 days of recording and/or registering the Notice, the System owner shall submit the following to the Department and the local approving authority: (i) a certified Registry copy of the Notice bearing the book and page/instrument number and/or document number; and (ii) if the property is unregistered land, a Registry copy of the owner's deed to the property, bearing the marginal reference.

7. Within fourteen days of the local approving authority’s issuance of the Certificate of Compliance for the System, the owner shall submit a copy of the Certificate of Compliance to the Department.

8. By January 31st of each year for the previous year, the System owner shall submit to the approving authority all data collected in accordance with item 7, above, and an O&M checklist and a technology checklist, completed by the System operator for each inspection performed during the previous calendar year. A Copy of the System checklist is attached to this approval.

V. Conditions Applicable to the Company

1. By January 31st of each year, the Company shall submit a report to the Department, signed by a corporate officer, general partner or Company owner that contains information on the System, for the previous calendar year. The report shall state: the number of units of the System sold for use in Massachusetts including the installation date and date of start-up during the previous year; the address of each installed System, the owner's name and address, the type of use (e.g. residential, commercial, school, institutional) and the design flow; and for all Systems installed since the date of issuance of this Approval, all known failures, malfunctions, and corrective actions taken and the address of each such event.

2. The Company shall notify the Director of the Watershed Permitting Program at least 30 days in advance of the proposed transfer of ownership of the technology for which this Approval issued. Said notification shall include the name and address of the proposed new owner and a written agreement between the existing and proposed new owner containing a specific date for transfer of ownership, responsibility, coverage and liability between them. All provisions of this Approval applicable to the Company shall be applicable to successors and assigns of the Company, unless the Department determines otherwise.

3. The Company shall develop and submit to the Department: minimum installation requirements; an operating manual, including information on substances that should not be discharged to the System and a recommended schedule for maintenance of the System essential to consistent successful performance of the installed Systems within 60 days of the effective date of this Approval.

4. The Company shall develop and submit to the Department a standard protocol essential for consistent and accurate measurement of performance of installed Systems, including procedures for sample collection, if necessary and analysis of the System within 60 days of the effective date of this Approval. The protocol shall be in accordance with the latest edition of Standard Methods for the Examination of Water and Wastewater.

5. The Company shall make available, in print and electronic format, the referenced procedures and protocol in paragraphs 4 and 5 above to owners, operators, designers and installers of the System.

6. The Company shall institute and maintain a program of operator training and continuing education, as approved by the Department. The company shall update the list of qualified operators and make the list known to users of the technology.

7. The Company shall prepare and submit to the Department an installation manual specifically detailing procedures for installation of its System. The Company shall institute and maintain a training program in the proper installation of its System in accordance with the manual and provide a training course at least annually for prospective installers. The Company shall certify that installers have passed the Company's training qualifications, maintain a list of certified installers, submit a copy to the Department, and update the list annually. Updated lists shall be forwarded to the Department.

8. The Company shall furnish the Department any information that the Department requests regarding the System, within 21 days of the receipt of that request.

9. The Company shall include copies of this Approval and the procedures and protocol described in Section VII (4) and (5) with each System that is sold. In any contract executed by the Company for distribution or re-sale of the System, the Company shall require the distributor or re-seller to provide each purchaser of the System with copies of this Approval and the procedures and protocol described in Section VII (4) and (5).

10. The Company shall comply with 310 CMR 15.000 and all Department policies and guidance that apply and as they may be amended from time to time.

VI. **Reporting**

1. All notices and documents required to be submitted to the Department by this Approval shall be submitted to:

Director
Watershed Permitting Program
Department of Environmental Protection
One Winter Street - 6th floor
Boston, Massachusetts 02108

VIII. **Rights of the Department**

1. The Department may suspend, modify or revoke this Approval for cause, including, but not limited to, non-compliance with the terms of this Approval, non-payment of the annual compliance assurance fee, for obtaining the Approval by misrepresentation or failure to disclose fully all relevant facts or any change in or discovery of conditions that would constitute grounds for discontinuance of the Approval, or as necessary for the protection of public health, safety, welfare or the

environment, and as authorized by applicable law. The Department reserves its rights to take any enforcement action authorized by law with respect to this Approval and/or the System against the owner, or operator of the System and/or the Company.